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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/473,988	12/29/1999	TOSHIKAZU INOUE	991493	1714

23850 7590 08/12/2003

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EXAMINER

DOAN, THERESA T

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 08/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/473,988

Applicant(s)

INOUE ET AL.

Examiner

Theresa T Doan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) ☒ Responsive to communication(s) filed on 25 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-20 is/are pending in the application.
- 4a) Of the above claim(s) 11-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) 2, 4, 7 and 9 is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5-6, 8 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some * c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☒ received.
2. ☐ received in Application No. (Series Code / Serial Number) _____.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____.

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1, 3, 5-6, 8 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Taniguchi et al. (6,232,663) as previously cited.

Regarding claims 1, 5 and 8, Taniguchi et al. teach in figures 1-11 a semiconductor device comprising a semiconductor element 10 formed on a semiconductor substrate 1, and a multi-layered interconnection structure 30 formed over semiconductor element 10 and electrically connected to the semiconductor element (figures 1 and 11),

wherein the multi-layered interconnection structure 30 is an interconnection structure of at least two layers in which a conductive film 10 or a lower interconnection

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layer and an upper interconnection layer 5 formed on an insulating interlayer are electrically connected through a contact hole formed in the insulating interlayer (figure 11, column 5, lines 32-67),

the insulating interlayer formed on a conductive film 10 includes:

a first insulating layer 2 of a composition containing SiH (column 6, lines 20-24);

and

a second insulating layer 30 formed on the first insulating layer 2; and

a third insulating layer 11 formed between the conductive film 10 and the first insulating layer 2,

the first insulating layer 2 has an H content of not less than 15.4 atom % in the composition ($\text{HSiO}_{3/2}$), and has been formed to cover the conductive film 10 with the third insulating layer 11 being interposed therebetween (figures 1 and 11), and

the second insulating layer 30 has a multiplayer structure that made up from layers of the same material (column 7, lines 7-62).

Regarding the process limitations recited in claims 1 and 8 (after curing), these would not carry patentable weight in these claims drawn to a structure, because distinct structure is not necessarily produced.

Note that a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal

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with this issue); and In re Marosi et al., 218 USPQ 289; and particularly In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that the applicant has the burden of proof in such cases, as the above case law makes clear. See also MPEP 706.03(e).

Regarding claim 6, Taniguchi et al. teach in figure 11 a semiconductor element comprises a memory cell having a floating gate formed on a tunnel insulating film on the semiconductor substrate 1, a control gate extending on a dielectric film on the floating gate, and a source and a drain formed in surface regions of the semiconductor substrate on both sides of the control gate, and memory information is written and erased by controlling the amount of electrons in the floating gate.

Regarding claims 3 and 20, Taniguchi et al. teach in figure 11 a contact hole for exposing part of a surface of the conductive film 10 is formed, an interconnection layer electrically connected to the conductive film 10 through the contact hole is formed, the contact hole having a moderately tapered upper wall surface at the portion corresponding to the second insulating layer 30 and the second insulating layer 30 having a multi-layer structure made up from layers of the same material.

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Allowable Subject Matter

3. Claims 2, 4, 7 and 9 are allowed.
4. The following is an examiner's statement of reasons for allowance:

The primary reasons for the allowance of claims 2, 4, 7 and 9 are the inclusion therein, in combination as claimed, of the limitation of a threshold at which a degassing amount from the insulating layer abruptly decreases upon a slight increase in the SiH content exists in the relation between the SiH content of the first insulating layer and the degassing amount from the first insulating layer wherein the first insulating layer has a SiH content not less than the threshold. These limitations were found in claims 2, 7 and 9.

Response to Arguments

Applicant argues that Taniguchi et al. disclose "an H content of $(\text{HSiO}_{3/2})_n$ before curing would have a value of 28.6 atom %", and would have a value of less than 15.4 atom % after curing. The argument is not persuasive because of the following reasons:

First, Taniguchi et al. clearly teach in figure 1, column 6, lines 20-24 that "organic films may be used for the SOG film 2. Instead of organic films, an inorganic material including ... Hydrogen Silsesquioxane $(\text{HSiO}_{3/2})_n$ may also be used in place of the SOG film 2"; therefore, inorganic material including $(\text{HSiO}_{3/2})_n$ is a final product;

Second, it should be noted that the arguments of counsel can not take the place of evidence in the record. In re Schulze, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965); In re Geisler, 116 F. 3d 1465, 43 USPQ 2d 1362 (Fed. Cir. 1997). In this case,

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there is no evidence of record which support that the value of 28.6 atom % of H content of $(\text{HSiO}_{3/2})_n$ is the value before curing. Therefore, if Applicant believes that H content of $(\text{HSiO}_{3/2})_n$ disclosed by Taniguchi is the value before curing and this value will be less than 15.4 atom % ^{after curing} then Applicant is requested to support that position with facts.

The rest of applicant's arguments, addressed to the amended claims are considered in the rejections shown above.

Conclusion

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Theresa T Doan whose telephone number is (703) 305-2366. The examiner can normally be reached on Monday to Thursday from 8:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, WAEL FAHMY can be reached on (703) 308-4918/4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

TD
July 29, 2003.



PHAT X. CAO
PRIMARY EXAMINER